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STOPS OR DIAPHRAGMS.

IT is not quite easy to determine why the short and convenient word "stop" has been universally accepted by the photographic world as a substitute for the longer one of "diaphragm," unless we remember that photographers as a rule are very practical folk and like things called by plain and short names.

It may be that the term "stop" was adopted from the fact of the light being really *stopped out* by the diaphragm; and as the Germans call it "blende," which means a blind or screen, there seems to be some probability that this is true.

Lenses sent out by manufacturers of reputation always have the stops supplied, and the position they occupy is generally fixed. This is true for such lenses as are not intended to be taken apart and their parts used alone; when this is the case, the position of the stop must be changed.

Now, in spite of all this, it will be found well worth while to be familiar with a few general facts about the diaphragm or stop. First of all, we may say that stops are used to improve the defining powers of the lens, particularly on the margins and corners of the picture. This is accomplished by stopping out such rays of light as would come to a focus too near the lens, and by allowing only such oblique pencils of rays to pass as come to their focus on the plane of the ground-glass. The pencils forming the more central portions of the picture, pass through the opening in the stop, and come to their proper focus in very much the same manner as they would if there were no stop at all in the lens.

It is fair to say that the type or representative lens of the present day is the symmetrical doublet; or, in other words, a lens consisting of a front and a back combination which are nearly or quite twins in every respect. A more exact term in optical parlance would be to speak of the lens as what it really is, namely a *system* of lenses.

Now, it is a matter of common observation that the position of the diaphragm or stop in these doublet lenses is always in the middle of the tube at equal distances from the front and the back combinations. If one of the combinations be unscrewed and removed from its position, the other one can still be used for photographic exposures. The focal length of either combination when thus used simply is about twice that of the original lens or "system," and the field covered by the single combination will be proportionately increased in size. But if the diaphragm or stop be left in its

original position, the work accomplished will not be nearly so good as it would be if the stop were moved to a new point to suit the new condition of affairs. Each of the combinations of the lens being of the meniscus form, the old rule should be here observed of turning the concave surface of the lens *toward* the subject, and of removing the stop to a distance of about one-fifth of the focal length in front of the said surface.

To take a familiar example; suppose an eleven-inch rapid rectilinear combination with the stop in the middle of the tube in the usual position, which is about an inch from either combination. Now, if it were desired to obtain the best results with either of the combinations alone, and thus to utilize the increased focal length of twenty-two inches, the proper plan would be to remove the front combination, leaving the back one *in situ*, and set the stop forward four inches from its anterior surface. In practice, this is seldom possible to do, unless a short extra tube be so adapted to the screw-thread in the front of the "system" that the desired increase of distance can be obtained. But we are sure that this hint will prove very serviceable to those who have failed in producing satisfactory results with either combination of a "system."

An attempt to use the front lens of a system alone, with the stop left in its original position, thus bringing it in the rear, would be in every respect unsatisfactory.

A great deal of mechanical ingenuity has been expended upon the different forms of stops or diaphragms. The simplest and least expensive of them is the common flat oblong piece of metal with the aperture in its centre. The sets of six of these which are usually furnished with the better classes of lenses should always have these openings quite concentric with each other. This can be verified at a glance by laying the stops together so that their sides correspond, when any want of exactitude in the openings will be seen at once.

All things considered, we should prefer this model of the stop or diaphragm to any other. The only objection to it is the danger of the loss of one or more of the set. In indoor work this risk will not make itself felt to the same degree as in Landscape Photography, where the loss of the stops would be a very serious matter indeed. A partial safeguard will be to rivet all the six together at the top, so that any one of the set may be inserted into the lens, leaving the others outside. Of course it may be objected that the loss of one will thus entail the loss of the whole; so it is indeed, but we can safely say, after many years of work out of doors with this arrangement, that a very small amount of care will keep matters right.

The new Iris diaphragms supplied with some of the superior makes of lenses, are new chiefly in the fact of an index and pointer being supplied so that a desired size of opening can be promptly secured at will. The principle of the Iris diaphragm itself is by no means new. The fact of there being no loose pieces to get lost is the strong recommendation of this form of stop; and when we have said this, we have pretty fairly summed up its merits. Supposing that the operator desired to make a change in the stop opening to one of another size, and that he also desired to effect the change without removing the focusing cloth from over his head and blinding his eyes with the strong light, the ordinary central stop would be preferable to the Iris. The change from one stop to another is easily done by feeling; while with the Iris model it is necessary to see just what is being done.

The "rotating diaphragms," as they are called, are also very convenient; more so we think than the expensive Iris; but their use is limited to the slower working lenses, which are never used with very large or full openings.

We may here take occasion to remark that practical photographing rarely, if ever, demands as many as six different stop-apertures. Taking Landscape Photography, for instance, we may safely say that three sizes of stops would be all-sufficient. One small enough to give good definition over the entire plate, and require a rather long exposure; a large one, nearly the full opening of the lens, for instantaneous effects; and one of medium size for subjects of odd character, would be enough for practical purposes, and directly conduce to good and uniform results in timing.

Nothing has ever been gained by altering the stop opening from a circle to a square, oblong, triangular, or other form. A circular hole, neatly countersunk in the metal, so that a mere edge is presented to the rays of light as they enter, is all that is necessary. Stops standing at an angle, and "sky-scrapers" as they used to be called, have had their day, and are now forgotten.

ELLERSLIE WALLACE.

ON THE DANGERS OF FLASH LIGHT COMPOUNDS.

Read before the Photographic Society of Philadelphia, at the meeting held January 1st, 1890.

WITHIN the last two years the community of Philadelphia has been startled by a series of fatal accidents occurring during the manufacture of magnesium flash-powder, a compound well known to photographers, whereby in all five human lives have been lost. On three several occasions explosions have taken place, each with fatal results, the last and most recent of all resulting in the death of three persons. As a natural consequence considerable attention and inquiry have been attracted to the subject of flash-powders and their probable dangers, and the writers of this paper were requested at a recent meeting of the Photographic Society of Philadelphia to prepare a report upon the subject.

The composition of the particular powder which was the cause of this disastrous loss of life is understood to have been powdered magnesium, chlorate of potash, picric acid and bichromate of potash. No one of these ingredients is in itself explosive except under extraordinary circumstances, and may be considered as safe; but the moment that they are mixed, an element of danger is introduced.

Many finely powdered metals are prone to rapid oxidation; give them the oxygen and the reaction takes place rapidly, and is frequently accompanied by heat and flame. Powdered magnesium and powdered zinc have been known to become sufficiently hot to ignite material in contact with them, on being wet with water.

The addition to magnesium of a chemical rich in oxygen, or holding oxygen loosely, so to speak, increases its susceptibility to rapid change.

For, instance, a match applied to some of the powdered metal will fail to ignite it, or occasions a mere glow from slow ignition; but let the magnesium be mixed

with chlorate of potash or nitrate of potash to furnish it with oxygen, and the whole mass will flash with almost explosive violence. Again, mix with the magnesium and chlorate of potash some carbon, and under some conditions a dangerous explosive will be formed. For instance, oxygen gas is made safely from the heating together of chlorate of potash and oxide of manganese; allow some carbon to be accidentally mixed with the two ingredients and heated, and a violent explosion will probably ensue. The rubbing together of chlorate of potash and some organic substances is accompanied with a crackling noise and frequently explosion, as instanced in the combination with sugar or tannin.

Such compounds as we have spoken of are known as explosives, as typically illustrated by gunpowder, a mixture of nitrate of potash, carbon and sulphur. Another and more dangerous class of chemical compounds which may be formed under some circumstances are known as detonators; that is, compounds the component parts of which are held together under so strained a condition of high tension that a very slight cause, such as a light, sharp blow will occasion them to fly apart violently with a sharp, loud report; in other words they detonate. The force of an *explosion* is felt at a greater distance than that of a *detonation*, but the disruption of surrounding bodies is greater and more complex with the detonation than the explosion. An explosion is generally accompanied by fire and smoke; a detonation is not.

Many detonating compounds may be heated and burned until consumed without discharge, whereas the detonation or snapping of a common pistol cap in contact with or near them, may detonate the entire mass; such is the method adopted in the explosion of mines, etc.

Picric acid is, in itself, we might say, perfectly safe, as it can be burned without danger, and will detonate only when confined. In compound, however, with some other bodies it produces a class of very dangerous substances, notably picrate of potassium, picrate of sodium, picrate of barium, picrate of strontium, picrate of magnesium, and picrate of lead. These substances are extremely unstable in character, and liable to explode with slight percussion or friction with the liberation of immense volume of gas. Sarran states the relative force of picrate of potassium, when exploded, as compared with gunpowder, is as as 1.98 to 1.00,—almost twice as great. A mixture of 0.5 kilograms of potassium picrate and 0,5 kilograms of potassium chlorate evolves through its combustion 352 litres of gases. 1 kilogram of gunpowder evolves but 200 litres under the same circumstances.

Picrate of magnesium is, when dry, one of the most unstable of its compounds, and therefore highly dangerous to handle. It may be made in a wet way by double decomposition or by the intimate mixture of the powdered ingredients. Time is, of course, an important factor in the latter process of manufacture, but a microscopical examination of the mixture after long standing will show that the metal has entirely disappeared, and the explosive compound been formed. There is no doubt but that this combination may be greatly assisted by the presence of atmospheric moisture. Powdered magnesium is quite hygroscopic, and has a tendency to cake together in loose masses, or adhere to the sides of a bottle, if exposed to a moist atmosphere. Picric acid when powdered is also rather sticky in character, and it can be readily seen how if these two substances existed together in a mixture they would be attracted to one another; then, given the elements of time, moisture, and perhaps some slight

warmth, and a chemical combination would inevitably occur. That this is not simply theory, but fact, can be substantiated by a fact lately mentioned to one of the writers of this article by Prof. Henry Leffmann, of this city, in a personal conversation. He stated that some time previous while microscopically examining a sample of flash-powder which contained picric acid, he was surprised to notice an entire absence of metallic magnesium, the yellow crystals of picric acid being alone prominent. On dropping the powder into water, however, an abundant sediment of metallic magnesium was deposited, showing its presence, and a closer examination of the powder showed that the particles of magnesium were completely enveloped in a yellow coating of picric acid. Of course these circumstances afforded a most fruitful opportunity for the conversion of these two substances into the explosive picrate of magnesium.

Here in is the probable explanation of the late calamity at the laboratory of Wiley & Wallace. A bottle containing in the neighborhood of several pounds of flash powder, made, after the before-mentioned formula, some eighteen months previous, was being emptied into a drain for the purpose of getting rid of it. No fire or other chemicals were known to have been present. Water had been thrown upon some of it to aid in its being carried down the drain. Experiments subsequently made proved that the presence of water would not occasion sufficient heat to ignite it. The most reasonable supposition is, therefore, that a small portion of the powder was detonated by an accidental blow and from thence the entire mass was detonated. No smoke or burns appeared upon the bodies of those killed, or surrounding objects, thus proving the absence of fire. For the preceding disasters by the same powder another theory must be advanced, as they occurred at the time of the mixing of the ingredients, and previous to the probable formation of the picrate of magnesium. In the first case there was an explosion during the process of grinding the material; in the second case, while the powder was being sifted. In the first case it can readily be seen that an explosion would be the natural sequence. In the second case it is probable that some clogging of the sieve occurred during the mixture of the materials. The loss of these five lives is a terrible caution against the use of the especial compound which caused the explosion, and a sufficient reason to regard with suspicion any powder the formula of which is not made public and known to be safe. This especial formula produced a compound which was alike unsafe to make, to use, or to keep. To sell such an article, therefore, for ignorant and unskilled persons to use, or to induce any one to attempt its manufacture, places a fearful responsibility upon those who knowingly undertook such a risk.

It is much to be regretted that the formulæ of most of this class of preparations are not published, and it is highly probable, in many cases, that their ingredients have been combined with but little regard to their chemical properties and the chemical reactions which might occur from their admixture, The fact that the compound may bear a label proclaiming it "safe" is but a very slight guarantee when its composition is altogether unknown.

It seems hardly necessary now, in view of all that has been said, to raise a note of warning in regard to the use of all these flash powders, but the statement has been already made that while this one particular compound was unsafe, other compounds are harmless. The writers wish to state, therefore, that they consider *all*

forms of flash powder dangerous, the difference between them being only in the degree of danger involved. As has been said, they are all composed of substances liable to rapid decomposition when in contact with each other, they are liable to form new compounds often possessing dangerous and unknown properties, their combustion is attended with an intense degree of heat, involving risks from severe burns, and they are liable to spontaneous explosion or ignition. This danger is greatly augmented when they are made or kept in mass, and the probable reason why a greater number of fatal accidents have not occurred is because the powders have mostly been made in comparatively small quantities and put up in separate packages, each containing but a few grains of the mixture. They contain, in most cases, chlorate of potash, bichromate of potash, permanganate of potash, ferrocyanide of potassium, nitrate of potash, amorphous phosphorus, and other highly organized compounds, the very purpose of their admixture with the magnesium being to increase its inflammability and the rapidity of its combustion. This can only be done by making the combination more unstable, and thus introducing at once a large element of danger. A simple mixture of magnesium and chlorate of potash, which has been claimed to be harmless, if placed in a confined situation, as in a pistol, and discharged by a cap, will detonate, and there is probably no compound of this character which does not possess some elements of danger.

Since the introduction of the different forms of the magnesium lamp, in which pure metallic magnesium can be burned with absolute safety, there seems to be but little reason why the use of flash powder should be continued, and as the only possible advantage in their use over that of the lamp is that a slight amount more of speed may be obtained, the question may well be asked whether the possible advantages to be gained are worth the additional risk involved in the use of the flash powder.

In conclusion, the following quotation from Eissler's work on "The Modern High Explosives" may well be cited here, more particularly in reference to combinations into which potassium chlorate enters:

"In mixing these compounds great danger is attendant, and too much circum-
"spection cannot be used. They explode instantly upon any violent stroke, very
"often by friction alone; sometimes spontaneously, as when in a state of rest, and
"no known cause for their combustion can be assigned. Many are deluded as to its
"safety by so-called experiments with freshly-made powder. Manufacturers of the
"compound may attempt to show its safety by hammering it and cutting it, and simi-
"lar tests; but let the powder be exposed to the natural atmospheric action, attract
"some moisture, then get dry, and the least friction or blow will cause an explosion."

The writers hope that the knowledge of the dangers attending the use of flash powders is now so diffused that no further accidents will result from their use, and that their manufacture will eventually be abandoned.

JOHN G. BULLOCK,
CHARLES L. MITCHELL, M.D.

[THE above paper on the dangers attending the use of magnesium flash powders, was read at the January meeting of the Photographic Society of Philadelphia. While admitting the force of the argument that the employment of complex compounds of an unstable character may be attended with risk, we cannot admit the conclusions of

the authors that all such powders should indiscriminately be condemned. There are many valuable compounds of chemistry which are indeed indispensable in the arts, notwithstanding some danger is assumed by their careless use, but such compounds are not rejected because of such risks. It has been demonstrated time and again that magnesium alone is *not capable* of giving the same actinic force as it does when combined with those chemicals which are necessary to increase its energy. For photographing living objects the pure magnesium powder alone is not capable of giving instantaneous exposures, and so we believe that photographers will continue the use of flash powder for such purposes. It is, therefore, hardly just to condemn the use of *all* such powders or to maintain that they should never be used, simply on the ground that there is a danger attending their careless handling. The danger to the photographer using the flash powders would be very slight indeed, as he only handles them in small quantities; there being but a few grains used at an exposure, and the manufacturer selling it as he does only in ounce packages, which are again subdivided into twenty smaller ones, reducing still farther any chance of damage in using such powders.—ED. AM. JOUR. OF PHOTOGRAPHY.]

OUR ILLUSTRATION.

DINANT, situated, say, 50 miles south of Brussels, on the river Meuse, in Belgium, and 18 from Namur, is a town of 7000 inhabitants. In 1467 the town, having incurred the anger of Phillipe le Bon, Duke of Burgundy, was besieged and taken, and the people treated with great cruelty; orders, however, were given that women, children, and priests should be respected. Fire, having been started by some soldiers discontented with their share of plunder, ran completely through what was left of the town, and reduced it to ruins; to complete its destruction, the towers and walls were razed to the ground by the besiegers. Oliver de la Marche, a French historian of the fifteenth century says, "Dinant was burned in such a fashion that it looked like a town that had been in ruins a hundred years. The glory of Dinant commences with its misfortunes; but the proud and aggressive character of the people was the principle cause of its disasters. It had long been famous for the "dinanderies" (counting 252 master beaters in copper in the time of Charles Quint), a kind of ornamented copper work; fine samples of which may be seen in the baptismal fonts in the church of St. Bartholemy, at Liege. At Dinant they occupied themselves particularly with the artistic forms of this copper work, while at Bouvignes, a small mediæval town about two miles below Dinant, they made the more useful articles. This trivial fact was the cause of endless feuds between the two towns, both of them at that time powerful and large; Dinant was represented in the thirteenth century as surrounded by a wall with 80 towers, and Bouvignes as an impregnable city. In fact, by industry, commerce, and population, it ranked as the second town in the province of Liège. It is even said to have rivalled this capital, whose population at the time was more than 120,000.

This unfortunate town was taken a second time by the French under the Duc de Nevers in 1554, and plundered, and a third time in 1675. The famous "couques de Dinant" are cakes made of flour and honey, run into flat moulds of the most varied and fanciful devices, such as fish, crosses, and particularly rude views of the town with rock and citadel. Some are very large (three feet square), and are believed to be a relic of the "dinanderies." They are not intended to be eaten, but constitute one of the principal industries of the place, and large numbers are exported. There are now numerous establishments for tanning, stone quarrying, and manufacturing of merinos and cachemires. The artist Wiertz was born here. The new iron bridge was finished October 24th, 1870, and during the laying of the foundations were found, a fine cannon of gilded bronze, a grave stone of 1369, coins, spurs, cannon balls, etc., etc. The citadel, approached either by 408 steps from the Hotel de la Tête d'Or close to the church, or by a carriage road going up behind the hill, commands a most beautiful and thoroughly unique bird's-eye view of the town and the river. Victor Hugo has spoken of the town of Dinant lengthening itself out like a sword blade. Good museums of local antiquities are found in the citadel; amongst other curiosities is the carriage in which Madame de Maintenon accompanied Louis XIV. when he came to superintend the seige of Namur. The church dates from the thirteenth century, and has been well restored. Rocher Bayard is believed to be so called from the celebrated horse named Bayard, who left the print of his foot on it when he plunged into the forest of Ardennes in search of his masters (Quatre Fils d' Aymon.) The cleft was widened by order of Henry XIV., to facilitate communication up the valley. Our illustration gives a good idea of the curious steep rock; the wagon road passes through the narrow space at the bottom. The shores of the river Meuse all about this region abound in picturesque subjects for the camera. Our view is made about a mile above the town, and the negative is on a Washed Collodion Emulsion Plate.

WHY does a sculptor die the hardest of deaths? Because he makes faces and *busts*.

WHY will the emblems of America outlive those of France, England, Ireland and Scotland? The *lily* will droop (France), the *rose* will fade (England), the *shamrock* will wither (Ireland), and the *thistle* will die (Scotland), but the *stars* are eternal (America).

VALUE OF SILVER WASTE.

IT is rather surprising that there should still exist in the minds of many practical photographers a good deal of uncertainty with regard to the true value of their silver and gold wastes. In the early days of the art very little attention was paid to the systematic saving of the precious metals in the waste, although Dr. Vogel, in his Handbook of Photography, in 1871, gave some interesting estimates of the amount of silver in the finished print and the quantity that goes to waste in the wash-water, hypo, clippings, etc. Of late years, however, close competition has compelled the photographer to consider his wastes as a source of revenue, and now, when the proper systematic care is exercised in saving them, but little that is valuable of the precious metals is actually lost. The writer, some years ago, made a number of experiments and assays to determine the amount of silver that went to waste during the process of silver printing. The results, which were published in a pamphlet, called attention to the very trifling amount of silver in the finished print, amounting to only about 6 per cent., and the large proportion which with care might be saved.

It is, perhaps, a little unfortunate that the possibility of recovering so large a per cent. of the silver used has led a good many to expect to get back really more than they have actually consumed. There are some photographers who, with a laudable desire to save all their paper waste, sweep into a corner of their printing room everything that falls upon the floor, and in a short time a pile accumulates, consisting of some clippings, with a varied assortment of old newspapers, card mounts, dry-plate boxes, broken negatives, nails, and pretty much everything, down to old hats and shoes. This heap is regarded with a jealous eye as a possible mine of great wealth, and when the meagre return from the refiner comes in the photographer is much disgusted, and in his ignorance of the simple facts in the case believes he is the victim of gross fraud. There are others who, through lack of time or interest in the matter, delegate the proper care of their wastes to some one in their employ. Of course the conscientious printer will do the best he can, if he has the proper instructions, but an intelligent supervision is always necessary in looking after the details of any business to insure success. Although it should not be the principal effort of the photographer to make the saving of his wastes the chief aim of his business, yet it is a matter which is worth a little personal attention, as he will then be able to form a pretty accurate estimate of the value of his wastes, and, having a knowledge of the amount of nitrate of silver purchased during the time, he can compare, with some degree of fairness, his expectations with the actual returns when they come in.

To do this, it is most important that the waste paper and residues should be kept clean and free from foreign matter. A barrel or large box in a convenient corner in the printing-room may be made the receptacle for all clippings, proofs and spoiled paper, and nothing else should be allowed to get in but silvered paper. Under such circumstances it will be easy to form a close approximation of the actual value of such waste. It must be borne in mind, however, that the presence of bromide paper, and especially blotters, will considerably lessen the value of the waste, while on the other hand many rich filters, or papers which have become saturated with the drip-

ping of nitrate of silver for a long period, will noticeably increase it. It has generally been conceded that 1 ounce of nitrate of silver is consumed in sensitizing 20 sheets of paper. As 20 sheets of silvered paper will be found to weigh 16 ounces or 1 lb., it follows that it will be impossible to get from a pound of such paper more than 1 ounce of nitrate of silver. Now as 1 ounce of nitrate of silver contains 63.5 per cent. of metallic silver the one pound of paper will contain 277 grains of metal. The value of metallic silver varies from day to day, so that the value of the waste will fluctuate in a corresponding manner. Supposing that fine silver was worth 95 cents per ounce (the average price for some months past), the value of the 277 grains of silver would be $54\frac{8}{10}$ cents. This $54\frac{8}{10}$ cents then is the actual value of one pound of perfectly clean silvered paper. Of course it stands to reason that there must be some expenses and profit to the refiner in recovering the silver from the waste, which must be deducted before the net value to the photographer is reached. These expenses may be great or small, but there must be some charge for refining, and as few photographers have the time or knowledge necessary to successfully refine their own wastes, they should not begrudge the modest charge deducted from the returns.

The experience of a number of years in the reduction of silver residues has enabled the writer to verify the above figures.

Paper silvered upon a 60 grains bath has been found by careful assay to contain 14 grains of metallic silver to each sheet, five grains existing as free nitrate of silver, which is removed in the washing before toning, the balance being chloride of silver, the bulk of which is dissolved out by the hypo. As 14 grains of silver are present in one sheet of paper, 20 sheets (or one pound) would contain 280 grains, a close approximation to the theoretical calculation. In another paper will be shown the value of the wet residues, toned prints and gold waste.

GEORGE BRINTON PHILLIPS.

WHAT is the difference between a young woman and an old one? One is careless and happy, the other hairless and cappy.

WHY is a bald head like the north pole? Because it is a great white bear (bare) place.

WHY was Powers the sculptor the meanest of men? Because he gouged a poor Greek girl out of a piece of marble.

A NEW DANGER TO AMERICAN INDUSTRY.

ONCE more an American industry is menaced and in danger of being proscribed in Continental Europe; this time it is the American dry plate that comes under the ban. The current number of the *Photographisches Wochenblatt* sounds the note of warning, and urges all amateur and professional photographers, under the circumstances, to beware of the purchase of any "Amerekanische Trocken-platten" (dry-plates), or keeping any upon their premises. The cause of this agitation is said to be the discovery of an insect which breeds in the emulsion on the dry-plates and films, and is said to prove as destructive to the plates as the potato-bug is to vines of that tuber,—and if the pest once gains a foothold in any gallery, every plate and negative will soon be destroyed, and the place become infested as a barn or granary with weevil.

Since the above mentioned urgent note of warning was issued to all Continental photographers, further particulars have reached us, together with the circumstantial account connected with the alleged discovery of one of the much-dreaded insects.

It appears that the son of Herr Isidore von Dunkelkammer, K. K. Geheim-Commerzien-rath, in Berlin, purchased from a local dealer a box of dry-plates of a celebrated American maker. On opening his purchase, in his dark room, he found securely intrenched between the two packages of plates a nondescript bug or insect. The youth, who is an active member of the "Sonntags-Photographischer Jäger-Verein," at once surmised that here was one of the much-dreaded insects, against which the note of warning had been sounded in the *Fach-blätter*. He reported the matter to his father, who, as an officer of the government, felt the weight of the situation which rested upon him; repairing to the dark-room, von Dunkelkammer ordered that the animal be put in a vial and hermetically sealed, and sent to the "K. K. Academic der Naturlichen Wissenschaften." A special meeting was called for the occasion, when the extreme thinness or flatness of the specimen was much commented on, whereby it would be able to force its way between the sheets of glass or film as they were packed in merchantable packages. The vial containing the specimen, as an extra precaution, was enclosed in another bottle, which was also sealed, and was ordered to be made the special subject for the next regular meeting of the faculty a week hence.

When the day arrived Prof. Raupe von Cassettenschieber opened the subject by stating that it was his sorrowful duty to inform the Academie that another American pest had appeared at the threshold of Europe, and threatened the ruin of one of the Fatherland's most beautiful professions and amusements, viz., die Kunst der Photographie, but that he had positive assurance that the Government would at once take the most radical steps to prohibit the introduction of any photographic material from America, in fact that the Imperial Council would place the same interdict on American films and dry-plates, as the Imperial Chancellor had placed on the American hog. The learned Professor was seconded in his remarks by Herr K. K. Hof-Photograf Weitwinkel; after which Dr. Aaron Eisenoxolat, inspector der Deutschen-reichs-Trocken-plätten, offered a resolution of thanks to all editors who had

given publicity to the new danger which threatened to ruin every photographer within the realm, which was passed unanimously. After which Herr Rudolphsohn von Momentverschluss, who was also "Intendant und Geheim-inspector des Staats-Detective Polizei," stated that by order of the Imperial Chancellor his department would at once take measures to seize all American dry-plates and films wherever found within the Empire, and that the confiscated material would immediately be taken to the Imperial Crematorium at Spandau, and there subjected to a heat of at least 2400° Fahrenheit, which the Sanitats Behörde had judged to be ample to destroy any molecules or germs which might escape from the packages during the operation.

A further resolution of thanks was passed complimenting Geheim-Commerzien-Rath von Dunkelkammer for his courage and diligence in capturing the dreaded insect, and his disposition of the same.

The members then adjourned to the Laboratory of the Academie, for the purpose of making a thorough and scientific examination of the captive specimen, so that an exact description could be published for the information of the public in general. Special preparation had been made. Dry plates of all known makers, domestic and foreign, were placed side by side, so as to allow the insect to pass over them consecutively, to see if any one make offered special attraction to the destroyer. It was concluded not to experiment on the subject with the various poisons, as in case any should prove fatal it would undoubtedly interfere with further investigation.

Not the least results were expected from the microscopic examination; this was to take place by the great bi-ocular-plano-electro-objective. For this occasion the subject was to be illuminated by an electric light generated by a purified currrent of electricity of at least 3000 volts, Siemen measurement; this part of the investigation to be under the immediate supervision of the celebrated specialist, Herr Baron Natron-Ritter v. Fixirlösung, and "Reichs-Staats-Geheim-Insecten Anatanom" der Kaiserlichen Academie, who was himself an enthusiastic amateur photographer of no mean pretensions. After the specimen was brought forth, and taken out of its double receptacle, it was carefully laid under the objective of the great microscope; as an extra precaution, the receptacles which had come in contact with the insect were all treated with a 99 per cent. solution of the new disinfectant, "Eiko-Gallioll."

After the focus had been properly adjusted, the learned professor ordered the following description of the specimen to be inscribed on the bulletin:

Genus.—Epizoa.

Order.—Hemiptera.

Head.—Small, from which project two long antennæ.

Eyes.—Compound, behind which are two transparent flaps, covered with bristles which are the rudiments of wings.

Thorax.—Broad and short.

Abdominal Segment.—Very large, broad, and extremely flat.

Color.—Reddish brown.

It was further ordered that Herr Grobschmidt, the Librarian and Archivar, should properly classify and enter the subject as "Der Americanische-Gelatin-Brom-Trockenplätten-zerstreungs-Käffer.

The members now in turn examined the subject under the microscope. Something of a sensation was caused when one Griffelschaber, a schoolmaster, and who

was only a member by courtesy, ventured the opinion that possibly the learned president was mistaken in his diagnosis, as in his humble judgment the specimen under examination certainly bore a strong resemblance to he *Cimex tectularius vulg.* The schoolmaster was at once called to order and threatened with expulsion if he did not remember his position.

After the ripple caused by the above interruption had subsided, the specimen Käffer was subjected to a current of electricity of fully 8500 volts, to insure its destruction, after which it was suspended in a vial of 95 per cent. alcohol, properly sealed and attested, and placed on exhibition in the "Museo der Academie."

When the action of the faculty was brought to the attention of the Imperial Chancellor, he at once entered upon the suggestions and issued the necessary edict, and as a sequence American dry plates will soon be excluded from Europe.

That this manifestly unjust action will be resisted to the bitter end by interested parties in this country, as the matter becomes known, may be taken as a foregone conclusion. It is hard to state what complications may arise if the German government persist in its course in the premises.

The initiative in the matter of retaliation was taken at the last meeting of the "Leopardville Camera and Tripod Club," where a resolution was passed: "Not to use any chemicals or photographic paper imported from Germany, until the obnoxious edict reflecting on American dry plates be repealed."

A communication was also sent to the State Department at Washington, with the request that the matter receive immediate attention. In response, the Consul General at Berlin has been telegraphed to, and several messages have passed to and fro on the subject.

Personally we have no doubt that taking into consideration the fact that the squadron of evolution is now in European waters, the whole matter will be amicably adjusted without delay. J. F. S.

WHY is a *poor* doctor like a mole? You can track him by his holes in the ground.

WHY do you suppose that tight-rope dancers are great favorites with the public? Because their performances are always encored (on cord).

WHY is a woman mending stockings deformed? Her hands are where her feet ought to be.

WHY is a chicken sitting on a fence like a penny? Because its head is on one side and its tail is on the other.

A DREAM OF PHOTOGRAPHIC PERFECTION.

ANY amateur properly infected or inoculated with the delights of photography invariably suffers with a yearning for "fresh fields and pastures new" in which to soothe the consuming fire of desire to accomplish something startling. He devours all the hand-books, almanacs, journals, and literature; buys apparatus of all kinds, till his pocket is empty; consumes whole oceans of solutions and quantities of reagents, without quenching his desire, though often getting a return of a few poorly developed negatives, improperly exposed, and lacking in artistic or chemical qualities. The professional brother meantime laughs in his sleeve, and the old conservative amateur, who knows all about "how the wheels go round," consoles the victim with "it serves you right," or "I told you so." But one of these victims dreamt of a possible relief from his troubles, and during the few sweet minutes of his illusion was the happiest creature imaginable.

He found himself in the goodly company of a lot of whole-souled, genial photographers, who had every successful method at their fingers' ends, and whose glib tongues could explain with lucidity every theory, or reaction, or method, and who were only too happy to give points that smoothed the paths of doubt and ignorance in which the dreamer had been stumbling. He was in a plain but thoroughly equipped working establishment, fitted out with cameras of all kinds for varying work; with arrangements for exposing and timing his plates, or making lantern slides, or enlargements, or reductions, or accomplishing the myriad undertakings of picture making—with appliances of every kind that conduced to quick working and good results. He saw how good tripods made steady cameras; how different lenses, or parts of one lens, made marvellous changes in the pictures; how a good lens could be determined by actual practice from a bad or indifferent one; and how, by the use of proper shutters and diaphragms, and color shields, and other means, so many things could be rendered that he had never thought of. There were complete photometric arrangements for determining the values of emulsions of different plates, and outfits for working with collodion, both wet and dry; there were easels of all sorts for artistic work, either for copying, enlarging, or retouching; and on all sides examples of the very best work ever accomplished, and of poor work, which would serve as a guide to warn against like misery. He found a perfect museum of finders, focussing-glasses, lenses, cameras, tripods, printing-frames, and the thousand-and-one concomitants used successfully in producing new effects, and was enabled to participate in the grand satisfying accomplishment of tangible results under the guidance of the genial spirits that flitted about him, and for once was as if in the heaven of photography!

He carried away with him in his dream these memories, and returned, at shortening intervals, to the scenes of such delight to find each time something that interested or delighted him, and was at last able to contribute something himself to the array that gave him so much comfort. But alas! the awakening came only too soon, and he found it was but a dream! His ideal had been shattered, and his hopes wrecked; he went on with his photographic struggle, half-hearted and weary,

yet feeling all the time there ought to be some relief, some hope, some means of accomplishing what had thus far been his consuming passion.

Was he too sanguine, or is there any possibility of finding the sympathy he wants so poignantly, physical, mental, artistic, and mechanical?

Is it a dream or phantom to imagine that by a combined effort of the many workers in photography such a "hall of delight" can be erected and constituted, and made practical? Is it impossible to organize a working institution with the appliances and surroundings dreamed of by the unhappy one? Surely no!

In London the Camera Club has rooms with just such surroundings, besides apartments for social and mental enjoyments,—collections of literature, art, and photographic appliances, with set courses of lectures and practical demonstrations; with competent and willing, even enthusiastic, men to lead on the tyros, and the club-rooms are a continuous joy and source of comfort. Boston and New York have approximations to this ideal, and more real enthusiasm among their workers and consequent happiness than can be imagined by those unprovided with these essentials.

That a unity of effort,—a long pull, a strong pull, a pull all together,—will accomplish results that amaze, and the dreamer need not fear that his ideal will vanish into thin air if he can but induce a few kindred spirits, endowed with his enthusiasm, to join him in such an undertaking. Therefore the dream may not prove unavailing, if, in the many communities of this progressive land, the photographic workers can be induced to come together to work in unity of effort to glean over the fields that have been cultivated by those gone before, and to plant new seeds of photographic progress, and even if unable to accomplish this much, at least be enabled to follow reasonably closely the plough of the skillful and successful workers of the present day, and comprehend the delights that are turned over in the furrows to grow to great growths of increasing knowledge in science, and æsthetic delight in art.

F. H. R.

January 2, 1890.

IN what color should a secret be kept? In violet (inviolate).

WHAT color is a sick dog? Purple (*purp* ill).

WHAT color are the waves and winds? The waves *rose*, and the winds blue (blew).

DARKENED SILVER CHLORIDE NOT AN OXYCHLORIDE.

ABOUT two years ago I published a series of papers in *The American Journal of Science*, the main object of which may be briefly stated as follows:—To prove that the substances which I described as "photo-salts," and obtained by purely chemical means, were identical with those produced by light, with both the visibly darkened substances, and the material of the latent image. Further, that all these substances consisted of a silver haloid (normal chloride, bromide, or iodide) combined with the corresponding subsalt, not in equivalent proportions, but after the manner of a "lake." The subsalts, being unstable substances when isolated, acquiring much greater stability by the union.

The only objections I have seen to these views were based on investigations made in England by Dr. Hodgkinson; his conclusions were that an oxysalt and not a subsalt was formed. Although several years have elapsed since his conclusions were made public, the means by which they were reached, and the necessary experimental proof, do not seem to have been published. Mr. Meldola, in his interesting *Chemistry of Photography*, in treating of this part of the subject, seems disposed to accept Dr. Hodgkinson's theory and his formula, $Ag_4 O Cl_2$, for darkened silver chloride. Mr. Meldola adopts my views that the photo-salts which I described, and which were obtained by purely chemical means, are identical with the products resulting from the action of light on the silver haloid, but expresses the opinion that I have not proved my theory of their constitution.

It has always seemed to me that the whole mass of observation on the action of light on silver chloride tended so thoroughly to indicate the formation of subchloride, that we might reasonably accept that view, at least, until something in the way of proof was offered for the oxychloride theory. But, waiving this objection, I will endeavor to show that subchloride and not oxychloride is the product of the action of light on silver chloride.

The question as to the presence or absence of oxygen in colored silver chloride is one that cannot be determined satisfactorily by quantitative analysis. Taking, for example, the formula just mentioned, $Ag_4 O Cl_2$, it would involve the presence of about three per cent. of oxygen if the entire mass of silver chloride were converted into this substance. But we know that even by the longest exposure the proportion of Ag Cl acted upon is very small. It would probably be a liberal estimate if we were to fix five per cent. of the whole mass as the proportion changed by light, so that the amount of oxygen that would—according to the oxychloride theory—be introduced into a given quantity of chloride by prolonged exposure would not exceed three-twentieths, or 0.15 of one per cent. of the material under examination—a dangerously small quantity on which to attempt to decide an important question, especially when the estimation is indirect. If even a very careful determination of the silver and the chloride present should bring the sum of these to a quantity represented by figures amounting to from 99.80 to 99.90, would it be allowable to assume that the difference between this and 100 consisted of oxygen, and so to take the presence of an oxychloride as proved? Such reasoning could not be accepted; the errors, incident to the most careful analysis, would too largely affect the point vitally

at issue, not to speak of the entire absence of proof that the deficient quantity was oxygen.

These considerations convinced me that it was not in that direction that one should seek for proof of the presence of oxygen in the substance in question. I therefore looked for what may be called *proof by exclusion.*

Coal naphtha (refined petroleum) is a substance absolutely free from suspicion of containing oxygen or moisture as impurities, so much so as to be universally used for the preservation of sodium. I have sodium that has been preserved in this way for over thirty years. Silver chloride was precipitated with excess of hydrochloric acid, was washed in a darkened room, and dried in a desiccator. From this it was transferred to a porcelain crucible, covered, and fused over a lamp. When thoroughly fused (in this condition it is as fluid as water) it was poured directly into naphtha. This naphtha had been placed to the depth of an inch or more in a dry porcelain vessel, which was first well wiped out with naphtha to remove the film of atmospheric moisture which condenses on surfaces.

The chloride congealed into a pale grey lump, which, whilst it remained under the petroleum, was absolutely free from all possibility of contact with oxygen, free or combined. Without removing it, the vessel was moved into the sunshine; when touched by sunlight, the chloride instantly became as black as ink.

This experiment seems decisive as to the oxychloride theory.

It seemed desirable not to stop here, but to find a means of applying an equally decisive proof by exclusion to the converse case. In the above instance, a photo-salt was formed by reduction, starting with normal chloride. The converse case would be the formation of a photo-salt by chlorination, starting with metallic silver, and excluding oxygen, free or combined, thus demonstrating that that element is not needed, and plays no necessary part in the formation of silver photo-chloride.

Anhydrous cupric chloride, which I at first thought of employing, proved to be insoluble in naphtha. In rendering ferric chloride anhydrous, there is a possibility of forming oxychloride; it could therefore not be employed. As it is not in the least important which halogen is used, I concluded to take iodine, which proved to be slightly soluble in naphtha, with a beautiful violet coloration. The mode of operation was as follows:—Pure silver reduced by cadmium from the chloride was heated nearly to redness in a porcelain capsule, and at the instant of removal from the flame was dropped into naphtha. Some fragments of iodine were added. Owing to the very small amount of iodine soluble in naphtha the action was slow, but continuous and regular. As fast as the iodine was dissolved it was taken up by the silver. At the end of some hours the iodine had disappeared wholly, and the napntha was colorless. Fresh naphtha replacing it failed to dissolve any iodine; the whole of it had combined with the silver to a black compound. This experiment may be varied by using a piece of clean silver foil, or even a silver coin that has been boiled a few moments with nitric acid, washed, and heated by a blast lamp; immersed in the naphtha with iodine its surface soon becomes perfectly black.

This reaction forms the complement of the other, and the two show that whether we start from silver chloride and proceed by reduction, or from metallic silver and proceed by iodisation, in either case we can obtain a photo-salt under conditions

which rigorously exclude all possibility of the presence of moisture or of oxygen in any shape.

Therefore the photo-salt is not an oxysalt, but, as I endeavored to prove two years ago, a compound of normal salt with subsalt.

The action of light upon silver chloride appears to take place in the following manner:—If any substance is present with which chloride can combine, either directly or by substitution,* the AgCl is decomposed with formation of subchloride. As the product is subchloride and not oxychloride, it is not necessary that the substances present should contain oxygen, as has just been shown. The subchloride thus formed instantly combines with a portion of the silver chloride as yet unacted upon by light, forming a photo-chloride of great stability, capable, for a time, of resisting the action of nitric acid. (I have shown that the photo-chloride made by purely chemical means also shows this stability.)

This combination is not by equivalents, but it is of the nature of a lake, and the affinity of silver chloride for the subsalt is of a progressively diminishing character. Small quantities of subchloride are held with great tenacity; as the proportion of subchloride increases the affinity diminishes. This is no assumption; it is easy to form chemical photo-chloride containing a large proportion of subchloride. Much of this latter is instantly decomposed by old nitric acid; with heat an additional quantity disappears, and so on, until the last portions may require hours of boiling with strong acid for decomposition.

This stable combination of the chloride and subchloride constitutes alike the material of darkened chloride, of the latent image, and of the photo-chloride.

An excellent mode of testing the value of a chemical theory is to observe its ability to explain, not only the general result of a reaction, but also the secondary facts observable. In the present matter—the action of light on silver chloride—there are two such secondary facts of a quite remarkable nature, for which, though long familiarly known, no explanation has hitherto been found, but which, I think, will be found to be readily and satisfactorily explained by the photo-chloride theory.

1. When silver chloride is exposed to light, there is a certain pause, an interval, during which very little action takes place. After this the darkening sets in rapidly; this fact is so conspicuous as to attract the attention of every one who exposes chloride paper.

The explanation is:—Light pink or violet photo-chloride is vastly more sensitive to light than white chloride, a fact proved by preparing light-colored photo-chloride by any of the chemical means I have elsewhere described, brushing it and white chloride, each in a pasty condition, over respective strips of paper, and exposing side by side; the difference in the darkening is very striking. Now, the first action of

* As to the action of light on silver chloride perfectly isolated, *i.e.*, in a perfect vacuum, it would appear, from an interesting experiment of Abney's, that no decomposition takes place. It was found that AgCl in vacuo did not darken, even by prolonged exposure.

This experiment does not indicate that the presence of moisture is essential for decomposition; it simply proves that some substance (by no means necessarily water) must he present upon which chloride can act. Accordingly, when the vacuum tube contained mercury, the AgCl was decomposed by exposure to light. It may be remarked that this last-mentioned fact, properly considered, would have been found to be fatal to the oxychloride theory, inasmuch as darkened chloride was formed in the total absence of oxygen.

light on white chloride is to form this light-colored photo-chloride, and whilst that is going on but little visible effect is produced. As soon as the photo-chloride is once formed the darkening becomes rapid. The time required for the first formation of the photo-chloride gives rise to the pause which is observable.

2. When pure, moist, silver chloride is exposed to light, the darkening goes on steadily to a certain point, and then virtually ceases. Although the mass may be constantly agitated so as to expose fresh portions, whilst it is kept moist, or, better, kept under water, the action of light after a few days' exposure ends almost wholly, and though the chloride now seems perfectly black, analysis shows that the amount of chloride altered has been very small—perhaps a twentieth. For this well-known and most remarkable fact I believe no explanation has ever been offered.

It is to be explained, I think, as follows:—When light acts on moist silver chloride, acid products are formed the nature of which has not been fully made out, but whose presence is certain. (If the exposure is made under water, the water reddens litmus; it does not bleach it.) These acid products would instantly destroy silver subchloride isolated. As long as the quantity of subchloride present, and combined with normal chloride, is small, the protecting power of the normal chloride saves the subchloride from decomposition. The ability of normal chloride to protect the subsalt rapidly diminishes, as already mentioned, as the proportion of the latter increases. These forces in time find an equilibrium (as in the case of many other chemical reactions) in which the quantity of subchloride becomes constant, and any excess that is formed by light beyond the quantity which the chloride can protect is instantly destroyed; consequently even the most protracted exposure fails to increase the proportion of subchloride beyond its limit.

The complete cessation of the reducing action of light, after a certain very small fraction of the chloride present has been attacked, cannot be explained by the oxysalt theory; for, if a small portion of the chloride has been converted into Ag_4OCl_2, there is no conceivable reason why a continuance of the same agencies at work should not affect the residue, and so go on until the whole of the silver chloride passes into the new condition. No theory deserves serious consideration that does not offer a satisfactory explanation of these two conspicuous facts: the pause at the outset, and the cessation of action as soon as a certain small proportion of chloride is reduced.

A confirmation of the explanation here offered is to be found in the fact that black forms of photo-chloride, chemically formed, are almost wholly unacted on by light. By treating metallic silver in a state of fine division* with sodium hypochlorite, black photo-chlorite is easily formed, which, after two or three treatments with hypo-chlorite solution, gives up nothing to cold nitric acid. It is almost wholly insensitive to light, because as fast as normal chloride is decomposed by light it is reconstructed by the conversion of a corresponding quantity of subchloride present to normal chloride. The chloride and subchloride are in an equilibrium, which the action of light does not alter.

M. CAREY LEA.

* For such purposes, metallic silver is best obtained by precipitating the nitric with sodium hydroxide in excess, and without washing, adding a solution of milk sugar. In a few hours the reaction is complete (Levol's method.) If the presence of any undecomposed oxide is feared, the product may be washed with ammonia.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A REGULAR meeting of the Society was held Wednesday evening, January 1, 1890, the president, Frederick Graff, in the chair.

The secretary read a communication inviting entries to the exhibition of the Worcesershire Camera Club at Kidderminster, England, to be held from March 1st to 15th. A prospectus accompanied the communication.

A letter was read from the New Orleans Camera Club extending the use of their rooms to visiting members of the Philadelphia Society. The secretary was authorized to acknowledge the invitation with thanks.

The annual report of the treasurer was presented showing a cash balance on hand of $820.68.

The annual report of the Executive Committee was read giving a resume of the work of the Society for the past year. A number of valuable additions to the library had been made, and a considerable sum expended for binding of journals, etc. Principally through the efforts of Dr. Ellerslie Wallace a complete catalogue of the library had been prepared, and was now ready for the printer.

Reference was made to various papers read before the Society, to the Third Annual Joint Exhibition held under the auspices of the Society during the month of April, and to the Fall Competitive Exhibition, now in progress, from which the Honor Pictures for 1889 would be selected.

The Committee on Membership reported the election of the following active members: Gustavus Cook, Alfred J. Kippelmann, Ewing L. Miller, Charles P. Sherman, and Henry Whiteley.

The Committee on Lantern Slides reported as follows: At the Conversational Meeting, held December 18th, the Interchange slides shown were those of the Syracuse Camera Club. This organization was admitted to the American Lantern Slide Interchange only this year, and their first contribution was certainly creditable to the members of the Club, and a pleasure to the members of this Society who saw them. There were seventy-six slides in all, most of them on gelatine dry-plates, and represented a wide stage of subjects, including some fine studies in Europe by J. M. Winter, Jr., Dr. Wasse, and F. W. Marlow, and several views in the Rocky Mountains by C. E. Lippe. John R. Clancy's slide entitled "Anthony" pictured a superb lion, and the same gentleman showed several novel balloon views. Slides by Arthur Beebe, W. H. Olmsted, and Fred. Frazer were also worthy of special mention.

Dr. Charles L. Mitchell gave the members a treat by showing fifty excellent slides, on gelatine plates developed by eikonogen, from negatives by G. E. Essig, of this city. The views were chiefly marine studies, made with a Hawkeye Detective Camera, and the cloud effects in most of the views were exquisite. Some of the latter were most striking and unusual. Slides were also shown by Percy Marcellus, Frank S. Lewis and Edmund Stirling.

Your Committee beg leave to suggest to the Society the propriety of having a public exhibition of lantern slides either during the coming month, or in March. The Society's public lantern exhibition in 1889 was given during the Joint Exhibition in April, so that your Committee has nothing to report in that respect.

The suggestion in the report to hold an exhibition of lantern slides was brought

up by Mr. Browne, who moved that the Committee be requested to arrange an exhibition of lantern slides at their early convenience. Carried.

The election for Officers and Committee for 1890 resulted as follows:

PRESIDENT.—Frederic Graff.

VICE-PRESIDENTS.—John G. Bullock, Joseph H. Burroughs.

SECRETARY.—ROBERT S. REDFIELD.

TREASURER.—Samuel M. Fox.

EXECUTIVE COMMITTEE.—(3 to be elected).—Ellerslie Wallace, M.D., Charles L. Mitchell, M.D., Edmund Stirling.

COMMITTEE ON LANTERN SLIDES.—Edmund Stirling, Frank Bement, William H. Rau.

COMMITTEE ON EXCURSION.—Samuel Sartain, John Carbutt, W. D. H. Wilson.

COMMITTEE ON MEMBERSHIP.—Henry T. Coates, John Bartlett, George Vaux, Jr., David Pepper, Edward W. Keene, Joseph H. Burroughs, Charles L. Mitchell, M.D., Frank Bement, W. H. Walmsley.

COMMITTEE ON REVISION OF MINUTES AND ARTICLES FOR PUBLICATION.—John C. Browne, John G. Bullock, Robert S. Redfield.

The vote for the Honor Pictures for 1889 resulted in the selection of these four pictures:

No. 15.—"Hesitation," by Robert S. Redfield.

No. 32.—"A Fair Quakeress," by Clarence B. Moore.

No. 31.—"A Wayside Spring," by Dr. Charles L. Mitchell.

No. 36.—"Making Friends," by Robert S. Redfield.

A paper prepared by Dr. Charles L. Mitchell and Mr. John G. Bullock on the "Dangers of Flash-Light Compounds," was read by Mr. Bullock.

Adjourned.

ROBERT S. REDFIELD, *Secretary.*

CONCURRENT DEVELOPMENT AND FIXATION.

[*A Communication to the Photographic Club.*]

YOU will remember that at our last meeting Mr. Davis stated that a friend of his had witnessed the development and fixation of a bromide of silver gelatine plate in one single solution. There seemed to be no one present who had any knowledge of this matter, and it had to be left as a question needing investigation.

I have no doubt that most of us then present were of the opinion that if such concurrent development and fixation were possible, it would possess very little practical value, and to that opinion I still hold, though I have subsequently proved that it may be done.

Last Friday evening I was thinking over the problem, and it occurred to me that I had the means at hand by which it could be accomplished. It was our friend Mr. Wellington's redeveloper that seemed to promise to be the very solution to answer the purpose, for it contains *two* fixing agents and a pyro developer.

I have already spoken here of a slight modification of mine of this method of intensification, which somewhat simplifies the operation. I take first a solution of

nitrate of silver, 100 grains to five ounces of water; second, 240 grains of ammonium sulphocyanide to five ounces of water; and third, 240 grains of hyposulphite of soda to five ounces of water. These can be kept separately any length of time, so far as my experience during the present year allows me to judge. To redevelop an already developed and fixed plate, either gelatine or collodion, take a drachm of each solution and put in one measure in the above order, and add thereto twenty minims of a ten per cent. solution of pyro (say sulpho-pyrogallol), and twenty minims of a twenty per cent. solution of ammonia. This may be poured on and off the plate as in the old days, a little glycerine making the adhesion to the plate more complete.

Now, in regard to the concurrent developing and fixing, I thought I should attain the object more certainly if I added a larger proportion of ammonia pyro in the first instance, so as to start the development before the fixing agents could have time to act, so as to reduce the part which had received the image. I therefore took a drachm of each of the five solutions, and added enough water to make it cover a quarter-plate. Taking the first negative which came to hand, a weak one, as you may judge by the positive, I exposed it thirty seconds and put it into the solution. It did not develop as rapidly as usual, and the fixation was somewhat prolonged on account of the weakness of the fixing portion of the solution. There was an appearance of fog, which was due in some measure to the thinness of the negative, and a considerable amount of non-adherent silver was thrown down on the plate and the dish, which I sponged away. To test if the image was really fixed, the plate was partially immersed for some time in hypo, which had no further effect. This plate is marked No. 1.

The next experiment was to see if the development would take place when the pyro ammonia was added to the fixing agents without the presence of the silver nitrate. The silver was omitted, and the plate soon became quite clear glass without the trace of an image. It thus seems that this method of development demands silver in the developer, in a manner analogous to that known to all collodion workers in all processes where the alkaline system was not used. It will be seen also that by the dissolution of the bromide of silver by the fixing agents, the solution becomes somewhat like Mr. Howard Farmer's intensifier, and development goes on after the fixation has been effected, as, indeed, might have been anticipated from the known use of the solution as a redeveloper.

The second example was treated in the same manner as the first, except that it was exposed half the time, and was not developed so long, and is therefore thinner, though it is probable that a longer immersion would have given greater density.

I regard this as simply a photographic curiosity, for I cannot detect anything in the process that promises improvement upon previous methods; indeed, it seems to point the other way, for the time of developing is considerably increased, and I should say that the separate solutions would do the work in a shorter time. Those who have time and taste for experimenting will doubtless find the matter interesting, and we may yet hear more of it.

W. D. RICHMOND.

WHY is a hen immortal? Because her son (sun) never sets.

WHY have domestic fowls no future state of existence? They have their next world (necks twirled) in this.

NEGLECTED PROCESSES.—WHY ARE THEY NEGLECTED?

IN a number of articles which have appeared in these columns of late, we have directed attention to several disused processes which are capable of yielding excellent results, in some, such as are not to be equaled by other methods. In this series no allusion has bern made to some which have become obsolete on account of being superseded by others, by which the same or similar results may be obtained by better or simpler means; nor has it been intended to include every means by which excellent photographs can be produced, though not at present used.

There are many systems—and useful ones, too—which come under the title of the iron processes, as well as other interesting ones of Herschel, Hunt, and other workers. These, by which a great variety of colors may be obtained, are well worth the attention of experimentalists, though they have seldom been alluded to of late years, with the exception of the ferro-prussiate and the platinotype, both of which are iron processes. An ardent experimentalist in these very early methods was Mr. Michael Hannaford, who, over a quarter of a century ago, produced excellent prints by several of them, and described the methods he adopted before the late South London Photographic Society, to whom he presented his examples. These are, we presume, now in the possession of the Photographic Club, as at its demise the Society's archives were presented to the Club. These pictures are now exceedingly valuable as proving the permanence, or otherwise, of the processes themselves, or of the modifications of Mr. Hannaford. A description of most of these interesting, if not really valuable, processes will be found in many of the older works of photography—for instance, Hunt's *Researches on Light*, and the various editions of his *Treatise on Photography*, from 1841 onwards—under the heads of cyanotype, chrysotype, amphitype, chromatype, ferrotype, catalysotype, etc. An article on the iron printing processes, with modern modifications, also appears in *The British Journal Photographic Almanac* for 1889.

Many who have read the articles on neglected processes have, not unnaturally, speculated as to why, if they really possess the advantages claimed for them, they have become neglected ones. The question is not an easy one to answer, for there may be, and probably are, several reasons why some, at least, of them are not at present in use. One reason undoubtedly is, that photographers are somewhat conservative, and slow to leave old method with which they are familiar for new ones which they will have to learn, even if the new ones would prove advantageous in the end, particularly when the new departure is a wide one. Notably is this the case with some processes, such as the chromotype of Lambert, the powder, and the stannotype process. In all these the whole system of photographic printing is altered. The materials are unlike those in daily use, and the systems are based upon an entirely different principle from that of silver printing. Hence comparatively few photographers could, or did, devote sufficient time and attention to the subject to acquire the necessary proficiency to work the process with uniformity and certainty—so essential for working on a commercial scale.

In some processes there was but a slight departure from the ordinary methods with which operators were perfectly familiar. The eburneum and the photo-crayon were essentially wet collodion processes, and why they were not more generally

practiced, considering the excellence of the results, it is certainly difficult to imagine. The albumen process, again; this is very similar in principle to the wet collodion, yet in England it has been little practiced, though, until the introduction of specially prepared gelatine plates, it was, without doubt, far and away the best method of making transparencies, either for the stereoscope or the lantern. It is true here, too, that considerable skill, which could only be acquired by practice, was requisite to obtain pictures such as those produced by Ferrier and others on the Continent, and few here gave sufficient attention to the matter to acquire that necessary proficiency.

A reason why processes which were undoubtedly good ones and exceedingly valuable were not at once adopted, is that they were introduced at the wrong period, *i.e.*, before their time. Notably was this the case with some of the photo-mechanical processes. For example: the late Mr. Fox Talbot more than thirty years ago produced engraved copper (intaglio) plates by an etching method analogous to, if not indentical with, those now so largely employed commercially, and, what is more, Talbot's work was in no way inferior to that now produced. Paul Pretch, again, about the same period produced intaglio plates and relief blocks in half-tone by methods very similar to those now employed; but these processes, like that of Talbot, did not succeed commercially, as the time was not then ripe for them. The same remark may be applied to photolithography. As far back as 1865 Messrs. Bullock Brothers produced photo-lithographs in half-tone which were quite as good as most of the commercial work issued at the present time, yet the process, good as it undoubtedly was, remained in abeyance as a neglected one for many years.

The chief object of the recent articles has been to direct attention to good and useful processes which are not being employed, and some of which might possibly meet with better practical success if they were reintroduced at another time or under different conditions, as witness the instances just quoted.

Already our articles would appear to be bearing fruit. It will be remembered that in our number for the 22nd ultimo we, when referring to methods of making negatives direct from negatives, gave a brief outline of Mr. Thomas Bolas's method, published in 1880. As will be seen by our last issue, this system was introduced and described as a novelty at the last meeting of the Photographic Society of France. The process, and the method of working it, is precisely the same as that published nine years ago by Mr. Bolas, since which time it has remained in abeyance, now to be resuscitated.—*British Journal.*

WHY was Eve not afraid of the measles? Because she had Ad-am.

IF a tough beef-steak could speak, what English poet would it name? Chaucer (Chaw, Sir).

HOW is it known that Adam was a provision dealer? He disposed of a spare-rib.

WHAT great Scotchman would you name if a footman knocked at the door? John Knox.

LITERARY AND BUSINESS NOTES.

A HISTORY OF THE SCHUYLKILL FISHING COMPANY OF THE STATE IN SCHUYLKILL; 1732-1888.—Those who are interested in the local antiquities and objects of historical interest in and around Philadelphia, may be already aware of the publication of this volume, which details the history of an organization unique of its kind. We gladly avail ourselves of the courteous permission extended to us, and reprint enough of the interesting contents of the volumes to give a fair idea of the objects for which the Society was founded, and for which it is still kept up. The book is handsomely illustrated with numerous phototypes by Mr. Gutekunst in his best style. There are some reproductions of old manuscripts, portraits, and pictures, and some excellent views of the old "Castle" at Gray's Ferry on the Schuylkill; besides a view of the same time-honored building after removal and re-erection at Andalusia on the Delaware. A number of the negatives for these views were made by a member of our editorial staff, who informs us that he used the Wet Collodion Process, with a preliminary coating of india-rubber applied to the glass to aid in the stripping of the film. Negatives for the phototype process always have to be treated in this manner; and if gelatine plates are used, some similar arrangement for removing the film must be made.

No pains or expense have been spared upon the volume, which may really be called an *édition de luxe*, and will be an ornament to any library. We will select the following extracts from the historical portions of the book, near its beginning:

"'The Schuylkill Fishing Company of the State in Schuylkill' is the present adopted charter name, received on the declaration of its independence.

"It was founded by the name of 'The Colony in Schuylkill,' in the year 1732, by a few of the original settlers, many of them emigrants with Penn to the New World—residents in and near the young and thinly inhabited city of Philadelphia. The Colonial Hall, in which the meetings of the young colonists were held, was judiciously selected in a wood bordering the western bank of the meandering stream, on the estate of William Warner, an amiable and worthy member of the respectable society of Friends. His Estate is now called Eaglesfield; successively since the property of Mr. Robert E. Griffith, recently of Mr. Robert Rundle, and now the elegant seat of Mr. J. J. Borie, is situated between 'Solitude' (Penn's Estate) and 'Sweet Briar,' the seat of Samuel Breck, Esq., about one mile above Fairmount Water Works.

"This well chosen and retired spot, comprising within its fenced boundaries about an acre of ground, was in the peaceful occupancy of the company until the year 1822, an eventful period of *ninety years*, when the damming of the river below, at Fairmount, destroyed the perch and rock fishing, and obliged them reluctantly to leave their much loved primitive domain, and emigrate with the finny tribe to the South, on the shores of tide water, near Rambo's rock opposite Bartram's celebrated botanical gardens.

"John Bartram, the celebrated self-taught philosopher, of whom Linnæus said that he was the greatest natural botanist in the world, was born near Darby, in what was then Chester county, in the year 1701. His grandfather of the same name came from Derbyshire, in England, in 1682. He was the first American who founded a botanic garden, and was appointed American botanist to King George III. The house in which he resided was built by himself. The stone was quarried and the timber prepared by his own hands, and on its completion he dedicated it by the following distich, which he engraved in front:

> To God alone, the Almighty Lord,
> The Holy One by me adored.
> John Bartram,
> 1770.

"In 1732, the clearings were few between the rising city of Penn and the retreat of the new 'Colony in Schuylkill.' A dense forest of majestic timber, the growth of ages, covered the whole western site of the city plot from its centre, and extended far and wide to the west, the north, and the south. These woods were tenanted by the nimble grey squirrel and rabbit, and frequently pheasants, partridges, woodcock plover, and snipe, and other game of the feathered creation were found in abundance.

"Our worthy sportsmen improved the glorious opportunity so conveniently presented almost at their own doors, and the fowling-piece and faithful dog were the inseparable companions of many members on their occasional trips to their favorite little territory on the banks of Schuylkill.

"The elections were annual, and the expenses moderate. They consisted chiefly in providing a good repast for the electors, after the closing of the poll and conclusion of the ordinary business.

"The viands on these great occasions consisted of substantial fare—rounds of beef, barbacued pig, sirloin steaks, and the productive industry of the angler and the fowler, accompanied with flowing bowls of good punch, lemonade, and Madeira, with the enjoyment of pipe and tobacco,cigars being in those frugal days an unknown luxury to the young colonists.

"Tickets were issued previous to election day to a committee of distribution and collection, for which, at the meeting, they accounted to the treasurer. The holder was entitled to a vote at the poll, and a seat at the banquet, on payment of the tax, which varied from five shillings to seven and six pence."

THE Eastman Dry Plate and Film Co. announces to the photographic public that it has sold its American business, plant and patents, and the same are now owned by the Eastman Company, a corporation organized under the laws of the State of New York, and having its principal place of business at Rochester, and that it has sold its European business, stock in trade and patents, to The Eastman Photographic Materials Company, Limited, a corporation organized under the Laws of Great Britain, and having its principal place of business at 113 Oxford Street, London, England. The new companies will co-operate to extend the sale of the Eastman Specialties throughout the world.

IT gives us pleasure to receive such an excellent magazine for young people as *Santa Claus*. Its tone is elevated and healthy throughout. The illustrations are highly original and artistic. Our energetic and able friend, Mr. H. N. Ballard, of the Agassiz Association, is now connected with the magazine, which is equivalent to saying that its pages will be rendered still more valuable than they were, by his clear and practical articles.

A recent number of *Santa Claus* has the following attractive contents:

Wreckers of Sable Island. Serial Story. Chapter VIII. By J. Macdonald Oxley; The Freight Brakeman's Story, by Wm. Reister Jenkins; Despatching Railway Trains, by Frank E. Blackney; The Old Clock's Midnight Soliloquies, by Charlotte W. Thurston; A Shot at Antelope, by W. J. Beck; A Fireless People, by Gordon Grant; Urashima and the Princess (a Japanese fairy tale), by Joel Benton; Mrs. Brink's Charge, by Bertha P. Englet; The Lights of Falaise, by Charles Prescott Shermon. Also shorter articles by D. M. Morrell, Philip E. Howard, Julia H. Thayer, and Henry Cleveland Wood.

The little children's pages contain stories and verses by Rebecca Cameron, Mrs. C. R. Whidden, Cora A. Lewis, S. F. G. Wilder, and others.

The illustrations this week are by C. J. Budd, Alice Douglas, Jesse McDermott, Lavinia Ebbinghausen, H. A. Kemble, and others.

WE have received the proof-sheets of the Catalogue of the Library of the Photographic Society of Philadelphia. It is high time indeed that this valuable collection of books had been put in order and classified. The Society having started to accumulate these books in 1862, will account for the numerous antiquated volumes pertaining to early processes that are to be found on its shelves. A large portion of these books may thus be said to be quite obsolete in so far as modern practice is concerned; but they are still interesting historically, and will often be found useful to those closer students of the art who endeavor to trace the growth or development of one process from another.

We understand that the present Executive Committee of the Society intend to make the Library a chief feature of usefulness, and to add numerous treatises and text-books to the collection, besides supplying all the best journals for daily reference. Journals pertaining to photography are now in the table cases, and they may be considered as the representative ones of present times; beside the American and English, there are also the German and one French; the latter being the official organ of the Photographic Society of Paris. The Preface to the Catalogue reads as follows:

"It is hoped that the following Catalogue will be useful in aiding those who desire to refer to the valuable Library belonging to the Society, its contents being now for the first time arranged in alphabetical order.

"A noteworthy feature in the Library is the number of complete sets of journals, dating from the earliest days of the art down to the present

time. Although separate text-books of the various branches of photographic science are not wanting in the Society's collection, the journals—which detail the progress of the art from day to day—still remain the most useful sources of information.

WE desire to call the particular attention of our readers to the paper on the "Value of Silver Waste," by Mr. George Brinton Phillips, of the firm of Phillips & Jacobs, 622 Race St. We are fortunate in being able to enrich the contents of our present number with this useful and clever article from the pen of a gentleman whose long and honorable experience in refining photographers' residues renders him a master of his subject, and his advice worthy of every attention. The advertisement of the firm of which Mr. Phlllips is a member will be found on another page. We hope that the subsequent paper hinted at in his present article may be soon forthcoming.

THE latest thing in photographic circles in Europe, is the establishment of a "Photographisches-Versuchs-Atelier mit Copiranstalt für Amateure," in Moll's Buildings, Tuchlaube 9, which was opened with great eclat on the first of January, 1890.

The new enterprise is under the immediate supervision of Herr Carl von Zamboni, a photographer of over twenty-five years' experience in the larger cities of the Austrian Empire.

In the new institution instruction and information will be imparted to amateurs on any point or subject relating to the art of photography,—from the first rudiments to the most complex formulas in photographic chemistry. A series of dark cabinets and operating rooms, supplied with all the latest inventions and modern conveniences, are at the service of the subscribers, where they can come at any hour for information or experiment, or practical instruction in posing, lighting, exposing, development, printing, and, in fact, the new venture is to be a "Versuchs-Atelier" or "experimental laboratory" in the fullest sense of the word. This, however, is not to be the only feature of Herr von Zamboni's Atelier: a number of copying and enlarging apparatus have also been supplied, and are at the disposal of amateurs. One of these can be so arranged that a subscriber bringing his negatives can see them greatly enlarged on a large ground glass while the attendant manipulates the negatives. There are also facilities for any amateur to make his own solar, bromide or platinum enlargements, or contact prints of any or all sorts, the paper, chemicals, and requirements being at their disposal.

Such amateurs as do not wish to develop or produce their own pictures merely have to send their negatives to the secretary with instructions as to what they want done. The Institute does the rest; retouching negatives and positives, copying, enlarging, or printing in albumen, algëin, aristo and platina, finishing in crayon, water color, and oil, are all prominent features of the new enterprise. J. F. S.

THE New Orleans Camera Club announces that it has opened its rooms, and extends a cordial invitation to all members of the American Lantern Slide Interchange and Photographic Clubs generally to visit them. Letters of introduction from the president or secretary of their respective clubs will insure recognition.

THE current number of the *Photographisches Wochenblatt*, published in Berlin, gives the following directions for making a cheap printing frame, viz.: take any old or spoiled glass negative of the proper size, and cut it in two, then paste a strong piece of black muslin over both pieces; when thoroughly dry this will form a hinge. For use place the sensitive paper on the negative to be copied in the usual manner, then a piece of blotting paper, after which lay the cut negative muslin side up on the paper, and secure the whole with four spring clips or clothespins, and print in the usual manner. Can this be original, or is it not a Yankee idea?

JANUARY BARGAIN LIST.

42 Select Lantern Slides, mostly foreign, very cheap.

Accessories:

1—Fairy Tripod $3 00
1—Carbutt's Multum in parvo Lantern 4 00
1— 6-in. Oscillating Burnisher, . 5 00
1—15-in. Oscillating Burnisher, . 10 00
1— 6-in. Eureka Burnisher, . . 8 00
1—Bromide Easel, with Kits up to 25x30 . . . . . 10 00
1—Haworth's Patent Camera Stand, for 8x10 . . . . . 6 00
1—Walmsley Reversible Finder 2 50
1—9x11 Glass Bath and Dipper . 1 80
1—Packard Rock 3 00
1—8x11 Exterior Background, light right 8 00
1—Card size Burnisher 3 00
1—Cameo Press 1 00
1—Rustic Wood Chair 5 00
1 copy Photo Mosaics for 1881, in cloth 50
1 copy Photo Colorists' Guide, . 75
1 copy About Photography and Photographers 50
British Journal Almanacs for 1889, reduced to 40
1—15-in Entrekin Rotary Burnisher 17 00
1—15-in Entrekin Eureka Burnisher 15 00
1—Fuming Box 4 00
1—15x18 Deep Porcelain Tray . 3 00
1—15x18 Japan Tray 50
1—Iron Centre Camera Stand, . 3 00
1—Seavey Swiss Cottage Accessory 12 00
1—8x10 Exterior Ground, good condition, ... 10 00
2—Spencer Head-rests 5 00
British Journal Almanacs for 1878, 20
Photo Mosaics for 1883, ... 20
1—8x10 Plain painted ground . 3 00
1—8x10 Osborne's interior background, new, light left . . . 20 00
1—4x8 Osborne's side slip . . 7 50
Pearl leads, the best retouching point in the market, each . 15
5x8 Woodbury Dry Plates, PER DOZ. 80
4¼x6½ " " . . . 65
6½x8½ Triumph " . . . 85
5x7 " " . . . 55
5x8 Neidhardt " . . . 65
4x5 Bridle " . . . 35
1—8x10 Hough's Exterior ground, good as new, light left of sitter $9 00
1—8x10 Hough's Exterior ground, light right 8 00
1—Hough's Oak Stump 7 50
1—Osborne's Bridge Accessory . 8 00
1—Osborne's Gate Combination Accessory, new 18 00
1—6x6 Chiidren's Fancy Ground 3 00
1—15 inch Smith & Pattison, Quadruplex Enameler, ... 25 00

Camera Boxes:

1—5x8 Novelette Camera and 6 holders 18 00
1—5x8 Tourist Camera, plate holder, tripod, case, and No. 2 Darlot Rapid Hemispherical Lens 27 00
1—4x5 "Midget" Pocket Camera, tripod and 6 holders . . . 18 00
1—8x10 American Optical Co.'s Portrait Camera, double swing 16 00
1—4 x 5 Waterbury Detective Camera, fitted with Roll Holder, and Plate Holder, in good condition, ... 18 00
1—Woodward Solar Camera, 7-in. condensing lens and ¼ size Voigtlander lens 25 00
1—4x5 Flammang revolving back Camera, lens and tripod, new; reduced from $37 to . . . 25 00
1—17x20 American Optical Co.'s Double Swing Portrait Camera, Bonanza Holder, good as new 75 00
1—5x8 Blair View Camera, single swing 17 00
1—Climax Outfit, including chemicals, complete 3 50
1—17x20 D. S. View Camera, good condition 40 00
1—5x8 Tourist Outfit, including 5x8 Tourist Camera Box, 2 Daisy Plate Holders, 1 Extension Tripod, and 1 Canvas Carrying Case, very little used. Price, new, $40.50, will sell for 30 00
1—10x12 Cone View Camera, Double Swing, new 52 80
1—5x8 Wet Plate Stereo Camera, 3 holders, case and tripod 25 00
1—6½ x 8½ View Camera and Lens, ... 12 00
1—6½x8½ American Optical Co. first qual. View Camera . . 23 00